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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/585,253

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Takahiro Ikeda

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EXAMINER

DOAK, JENNIFER L

ART UNIT

PAPER NUMBER

2872

NOTIFICATION DATE

DELIVERY MODE

09/29/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DBRIPDocket@dbr.com
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Office Action Summary

Application No.

10/585,253

Applicant(s)

IKEDA ET AL.

Examiner

JENNIFER L. DOAK

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/5/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1-8 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-8 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☒ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 05 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO 943)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/21/10, 10/29/07.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it exceeds the word count limit.

Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 reads "at least one of a bright point interval (435 – focal spot) and initial phase value of respective bright points constituting a target reconstruction image to be displayed (on 427 – medium) is set such that peaks of the reconstruction light, reaching a region where the observation of reconstruction image obtained through diffraction of a specified order in said spatial light modulation element is permitted, are produced at different plural points on a back

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focal plane of said reconstruction image converting optical system." Claim 4 contains similar language.

First, with numerous apparent appositives not set off by commas or other appropriate spacing or punctuation, it is unclear which element matches with which behavior/activity. This is similarly difficult, to a lesser extent, in the depending claims.

Second, the extent of the alternative is unclear: whether it is "at least one of a bright point interval and initial phase value of respective bright points;" or whether it is "at least one of a bright point interval and initial phase value of respective bright points ... are produced ... optical system[;]" or whether the intended alternative is somewhere in between these possibilities.

Since the verb conjugation of "are produced" is plural, it seems that the intended reference is back to "initial phase value of respective bright points." Thus, for examination purposes, the remainder of the claim will be considered to be part of the alternative inclusive with this phrase.

All depending claims inherit the same deficiencies. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Curtis (US 6163391).

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Regarding claims 1 and 4, Curtis discloses a three-dimensional image displaying (title - holographic recording) apparatus, comprising: a spatial light modulation element (Fig. 14 - SLM) having a discrete pixel structure (col. 4, lns. 49-59 - constraints on mask ... pixels) and expressing a hologram (col. 5, lns. 6-7 - for recording a hologram); an illumination optical system (440 - object beam) generating reconstruction light by causing illumination light to enter said spatial light modulation element that expresses the hologram (note beam path); and a reconstruction image (on 427 - medium) converting optical system displaying a reconstruction image by producing a virtual image wavefront-converted from the reconstruction light (on 427 - medium), wherein at least one of a bright point interval (435 - focal spot) and initial phase value of respective bright points constituting a target reconstruction image to be displayed (on 427 - medium) is set such that peaks of the reconstruction light, reaching a region where the observation of reconstruction image obtained through diffraction of a specified order in said spatial light modulation element is permitted, are produced at different plural points on a back focal plane of said reconstruction image converting optical system (in the alternative).

Regarding claim 2 and 5, Curtis further discloses the initial phase value of each of said respective bright points, constituting the target reconstruction image, is varied as time elapses (col. 1, lns. 22-29 - shifting ... back focal plane).

Regarding claim 3, Curtis further discloses a mask provided on the back focal plane of said reconstruction image converting optical system (i.e., SLM to the left), said mask transmitting light components reaching the peak positions, among the reconstruction light reaching within the region where the observation of reconstruction image obtained through the

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diffraction of the specified order is permitted (via SLM), and blocking light components obtained through diffraction of a different order other than the specified order (i.e., mask).

Regarding claim 6, Curtis further discloses a mask (SLM), which transmits light components reaching the peak positions (e.g. 435, 420 – focal spots), among the reconstruction light reaching the region where the observation of reconstruction image obtained through the diffraction of the specified order is permitted (i.e., near medium), and which blocks light components obtained through the diffraction of a different order other than the specified order (i.e., mask), is arranged on the back focal plane of said reconstruction image converting optical system, and wherein the reconstruction image is displayed by means of the light components having passed through said mask (col. 1, lns. 22-29 – shifting ... back focal plane).

Regarding claim 7, Curtis further discloses the interval of the peak positions (e.g. 435, 420 – focal spots) of the reconstruction light reaching the region (i.e., near medium), where the observation of reconstruction image obtained through the diffraction of the specified order in said spatial light modulation element (SLM) on the back focal plane of said reconstruction image converting optical system, is smaller than the diameter of the pupil of an observer observing the reconstruction image (col. 1, lns. 22-29 – shifting ... back focal plane).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis (US 6163391).

Regarding claim 8, Curtis further discloses when the wavelength of the illumination light is λ , the focal length of said reconstruction image converting optical system is f , the pixel pitch of said spatial light modulation element is p , the diameter of the pupil of the observer observing the reconstruction image is d (col. 7, ln. 4 - $\pi\lambda F/L = dc$ spot width), the interval of the bright points of an equal initial phase value among the bright points constituting the target reconstruction image (dc spot width). Curtis does not explicitly disclose that Np (N is an integer of two or more), the following relationship is satisfied: $d/2 > \lambda f / (Np)$.

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However, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233 (C.C.P.A. 1955). The benefits of optimizing the system is to get an improved quality image.

Therefore, it would have been obvious to an ordinarily skilled artisan at the time of invention to optimize the system to achieve the quantitative relationship so as to improve image quality.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Doak whose telephone number is (571)272-9791. The examiner can normally be reached on Mon-Thurs: 7:30A-5:00P, Alt Fri: 7:30A-4:00P (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone B. Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JENNIFER L DOAK/
Primary Examiner, Art Unit 2872